IDENTIFICATION OF DIFFERENT MEAT VARIETIES AND DETERMINATION OF MEAT ADULTERATION USING A POLYMERASE CHAIN REACTION BASED METHOD

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ABSTRACT

Meat is a food rich with a variety of important nutrients which lacks in plant food sources, particularly lysine, bio-available iron and zinc and etc. Nowadays, it has a significant problem regarding its quality due to fraudulent substitution of more expensive meats with cheaper meats. Therefore, the identification of species origin of meat is a considerably difficult task. The aim of this study was to establish a qualitative Polymerase Chain Reaction (PCR) based method to detect dog (*Canis lupus familiaris)* meat adulteration in mutton and horse (*Equus ferus caballus*) meat adulteration in beef. The mitochondrial cytochrome b (Cyt b) gene was used as the target gene to amplify 809 bp, 157 bp, 251 bp, 335 bp and 365 bp regions of dog, goat (*Capra aegagrus hircus*), cattle (*Bos taurus*) and horse Cyt b genes respectively. Dog and horse meat samples used in this study were authenticated by the Department of Veterinary Medicine and Animal Science, University of Peradeniya. Veterinary surgeon certified mutton and beef were obtained. Mutton containing 1%, 5% and 20% (w/w) of dog meat in raw and cooked (45 minutes boiling in distilled water) form and beef containing 1%, 5% and 20% (w/w) of horse meat samples were used in DNA extraction and subsequent PCR analysis. Results indicate that adulterations as low as 1% were detected by PCR. Moreover, a clear relationship was observed between the intensity of PCR products and percentage of dog meat in mutton. The high sensitivity of PCR, which facilitates accurate and more reliable analysis of meat adulteration, is shown in this study. Therefore, the qualitative PCR based method used in this study can be used as a pragmatic solution to detect dog meat adulteration in mutton and horse meat adulteration in beef.